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**Sustainability concern in value management: A study on Government's building project**

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**KEYWORDS**

Sustainability, Value management, Malaysian Government, Building project

**A B S T R A C T**

Active promotions of sustainable development by government and non-governmental organisations have proved that Malaysia is committed to reduce the nation's carbon emission intensity by 40% per GDP by 2020. The building industry was identified as one of the biggest resource user, therefore sustainable building is seen to be the effective way to reduce it. To date, only 6 government buildings were certified as 'Green Building' which did not reflect to the initiatives and policies made by the government in sustainable practice although it has already begun since 1979. Value Management (VM) has been recognized by Malaysian Government as a strategic planning tool and it has been practice ever since, a suitable mechanism to deliver sustainable construction project. In order to propose the idea of integrating sustainability in VM practice, a field study was conducted to VM practitioners, which involve in government-building projects. The survey was to investigate sustainable consideration in the existing practice of VM. The aim of this paper is to investigate sustainable consideration in the existing practice of VM. This study found that the sustainable knowledge between VM practitioners and the attention given to the project sustainability were only at moderate level. This study provides evidence to suggest that sustainable concern is not one of project's priorities, which could prove the need to integrate sustainable concern and VM practice in buildings project to enable better involvement of sustainability into present governments' practice.

**Introduction**

There is a noticeable shift in awareness of climate change issues. The impacts of climate change are already being experienced across the globe with extreme

weather events and Malaysia is not exempted. Rains causing flash floods, massive crop failures, water shortages, forest fires which was triggered by droughts

and the increased of hot days and warm nights are the impacts of extreme climatic changes in South East Asia Country as reported by the Intergovernmental Panel on Climate Change (IPCC)(IPCC, 2007).

The climate change is projected to impinge on the sustainable development of most developing countries of Asia, as it compounds the pressures on natural resources and the environment associated with rapid urbanisation, industrialisation and economic development. To combat climate change, Malaysia has committed to reduce up to 40% of carbon emission intensity of Gross Domestic Product (GDP) by the year 2020. According to Melchert (2007) building industry has been identified as one of the big resource user which consumes 8–50% of the total energy (Saidur, 2009). Therefore Improving energy efficiency in buildings is one of the most cost-effective measures for reducing carbon dioxide (CO<sub>2</sub>) emission which it is one of the main causes of global warming (Lombard *et al.*, 2008; Omar and Mohammed, 2004; Jaber *et al.*, 2003; Chow, 2001; Farhanieh and Sattari, 2006; Uchiyama, 2002; Radhi, 2008; Yang *et al.*, 2008; Yamtraipat *et al.*, 2006; Saidur, 2009).

Planning and developing infrastructure, buildings and facilities need to be handled in coordinated manner to reduce the impact of construction and operations to the built environment. Government plays a big role when dealing with sustainable matters. It may require different approach to design and new ways of looking at the appropriateness of what is being built. Numerous tools and techniques can be applied to better deal with this shift from current practice to resource efficient approaches and new system thinking within the design and construction process to better comprehend the existing practice in government. Value Management

was first applied in Malaysia in 2009 and has been mandatory to be practiced to all government projects value more than RM50 million above to ensure value-for-money for public investment, creating a strong link between funding and outcomes (10<sup>th</sup> MP, 2010).

As a developing country, the construction industry is considered one of the biggest factors effecting on the environment compared to developed countries, due to the fact that developing country is still under construction. Hence, the sustainable construction is a concept to be adopted by the government for developing strategies and plans to improve the consideration of sustainability in construction practices. With building industry has been recognized as one of the big resource user, improving energy efficiency in buildings is one of the most cost-effective measures for reducing carbon dioxide (CO<sub>2</sub>) emission which it is one of the main causes of global warming (Lombard *et al.*, 2008; Omar and Mohammed, 2004; Jaber *et al.*, 2003; Chow, 2001; Farhanieh and Sattari, 2006; Uchiyama, 2002; Radhi, 2008; Yang *et al.*, 2008; Yamtraipat *et al.*, 2006; Saidur, 2009). Hence the building sector into the plan of action is important in order to achieve the target for carbon dioxide reduction. Even with a small increase in the sustainability of buildings, it will help to reduce the effects on greenhouse emissions, which is better than nothing.

As cited in Abidin (2010), in order to startup sustainable movement awareness and knowledge is the main factors, then comes interest and demand, and follows with implementation. Through personal commitment to it, then only behavior changes will come about (Du Plessis, 2007). Hence to encourage a person or organization to commit to something, their personal

values must be satisfied. Through studies conducted, the sustainable concept can be economically viable (Bartlett and Howard, 2000; Bogenstätter, 2000; Heerwagen, 2000; Hydes and Creech, 2000; Langdon, 2007). Construction practitioners in this knowledge need to be conveyed to encourage the acceptance. Negative perceptions and attitudes to build sustainably are still applied but these actually the ignorance and represent their genuine concerns about cost, value and risk and sometimes from bitter experience. Only by practicing and implementing the concept, people will learn from experience and start making improvement (Abidin, 2010) and from effective combinations of strategy, design, production, handover and management it will result a better outcomes (Bordass, 2000). Furthermore, Hayles and Fong (2008) proposed that VM can be used as a tool to develop knowledge and relationships within the construction and building industries to integrate and climate change adaptations as ‘embedded practice’ rather than innovation.

The aim of this paper is to investigate sustainable consideration in the existing practice of VM. The purpose of this paper is to determine the sustainability consideration in the development of the government project among the value management (VM) practitioners. The survey and field study was conducted to VM practitioners who involve in the government-building projects in order to propose the idea of integrating sustainability in VM practice.

### **Value Management (VM) in Malaysia**

Hammersley (2002) indicated that the use of Value Management (VM) has been inclined within construction industry in order to support project decision making, and at the same time achieving ‘best value’

for clients’ (Mohamad and Coffey, 2010; Shen and Liu, 2003). Increasingly many organizations are adopting VM in a range of wider management and boardroom issues, such as strategic planning, scenario planning, business process improvement, and business continuity, stimulating innovation and change management. In Malaysia, VM was introduced to the Malaysian construction industry in 1986 (Jaapar and Torrence, 2005) and only by the end of 2009, the Government of Malaysia (GoM) decided to imposed VM studies to all government projects and programs which value MYR50 million (USD 16 million) and above (EPU, 2009). VM was considered as a strategic planning tool, which will ensure projects to be delivered at optimum cost, value for money, and meets it performance level. It will help the government to find new ways, alternatives and proposing best solution from the conventional ways.

“ Value Management Implementation Guide for Government Projects/ Program” (EPU, 2011) known as VM Manual, was launched and was set as a guideline for government ministries/ agencies to practice VM accordingly. VM has now become a management tool in Government of Malaysia practice for project implementation since it is accepted to (EPU, 2011):

- i. Improve the accuracy of assumptions used during planning;
- ii. Identify the actual needs to achieve specified function;
- iii. Promote and generates creative ideas;
- iv. Optimize the use of resources;
- v. Accelerate decision making;
- vi. Ensure and improve the standards, rules, procedures, and criteria for a project to be consistent with the development and needs;

- vii. Enhance performance and synergy of participants in group work;
- viii. Minimize gold plating, and
- ix. Take into account the use of Life Cycle Cost (LCC).

Thus, VM practice in Government projects will provide several benefits such as:

- a) The project meets the needs of stakeholders and accepted by the public;
- b) Obtaining an efficient capital expenditure;
- c) The functions and qualities of the project are met;
- d) Ensure that the projects undertaken achieve value for money, and
- e) Increase the level of transparency, coordination and understanding of implementation of a project.

Based on the understanding, VM give better decision-making, increased effectiveness, improved internal communication and is a value enhancement technique therefore it definitely benefited to the government sector if conducted appropriately and contributed to the project's achievement.

### **Value Management (VM) and Sustainability**

They are various ways with different tools and techniques which sustainable concept can be practiced in a construction project. The idea of incorporating sustainability issues into VM studies is not a new one, as it has already been proposed by a number of scholars (Abidin and Pasquire, 2005; Al-Yousefi, 2008; Alexandre *et al.*, 2007; Saleh and Taleb, 2010; Yeomans, 2002). To sum up, the overall objectives of VM and sustainability tend towards the same direction. VM strives to achieve optimum value based on the projects objectives; while

sustainability will try to achieve value not just economically, but as well as environment and the social aspects of the projects. The concept of integration according to Abidin and Pasquire (2006), it refers to the combination of sustainability aspects into VM practices to enable those issues be considered and integrated throughout the whole process and decision-makings in VM. Over the years, the issues of sustainability has been on the increase in the construction industry and it has prompted the need to seek for appropriate ways which will enable this phenomena to be absorbed into present working environments of construction. Further, Abidin and Said. (2006) mentioned that value management possesses many qualities which can be utilised to enhance the incorporation of sustainability issues within project plans, designs and decisions. This is simply because in a construction project, value management is carried throughout the project to check that the project will deliver value by probing the assumptions on which the project is based and seeking opportunities to add value.

Value management is a project planning technique used in construction projects to improve outcomes and provide best value for money. It provides a clear and logical sequence which can be a highly effective tool applied on all types of projects where other problems and issues require well founded and considered resolution and a high level of acceptance by all stakeholders. According to Abidin and Pasquire (2006), the special characteristics and processes inherent in value management makes it a useful tool in delivering sustainability, in that value management offers opportunity to include sustainability issues early in the project where its impact will be greatest. The series of workshops carried out during value management study ensures that

sustainability agenda does not fade away as projects become more complex. Furthermore, Yeomans (2002) stated that VM as the most robust mechanism to deliver a balance concept of the three interconnected dimensions of sustainability, i.e environmental, social and economic.

### **Barriers and challenges of Value Management (VM) sustainability**

Most countries in South-East Asia are facing with the growing environmental problems that have been the natural consequence of economic development. Malaysia is one of the few countries in the world that has actively attempt to balance environmental conservation with economic development. Although VM can be one of the ways to promote sustainability issues at the early stage of project, there were several challenges have been identified by Abidin and Pasquire (2005) to integrate the issues into VM studies are divided into:

- i. Practical barriers
  - Time limitation: It is impractical and difficult to address all issues of sustainability within VM studies.
  - Absence of formal guidelines: Different respondents possess different sustainability practice, without a standard guidance the deliverance of sustainability through VM is difficult.
- ii. Behavioral barriers
  - Lack of awareness of sustainability: It is due to the lack of knowledge being disseminated in VM studies. The level of sustainability knowledge among VM practitioners would help to understand the importance of achieving sustainability of the project and provide basic need to broaden their scope to include all the three main theme of sustainability.

- Misperception about integration of sustainability and VM: Seeing sustainability and VM as two separate issues, which it becomes a burden to
- the VM participants as additional tasks when applied in the studies.
- Passive behavior among VM practitioners: VM practitioner's remains passive to forward sustainability knowledge to client's attention; due to they may not have adequate knowledge to drive them into demanding sustainability.

Shafii *et al.* (2005) pointed out several issues that contributed to barriers in sustainable construction. It is summarized in Table 1.

Having realize the existence of several barriers to integrate sustainability in VM from Abidin and Pasquire (2005) study, it may suggest that these barriers might exist in the current practice of VM in government projects. Hence a study was conducted to investigate the dissemination of sustainability knowledge and sustainable consideration given to the project among VM practitioners, presenting new insights and adding to the existing body of knowledge.

### **Methodology**

Field studies were undertaken to aid the understanding of existing practices of VM in its attitude towards sustainability. VM characteristics have made it asa prospect for an effective method to incorporate sustainability issues in government projects. Furthermore, from the literature it is acknowledged that the existence of sustainable policies, legislation and guidelines has been established in Malaysia back in 1970's. Based on this, sustainability is expected to be inherent in government

practices, which in this case in VM studies. Saleh and Taleb (2010) claimed that integrating sustainability with VM practices has not yet been widely put into practice around the world, as it only been proposed in the literature “theoretically”. As the concept is relatively new to construction industry in Malaysia, it is more towards understanding the existing situation. Although this study may lacks practical application in the short term, but it may builds a foundation for knowledge and broad understanding that has an impact on other issues as well. Therefore quantitative approach was adopted. The respondents were identified as the VM practitioners involve in VM lab. The primary use of sampling in quantitative studies is to create a representative sample that closely represents features of interest in a larger collection of cases (Neuman, 2011). The questionnaire was divided into three (3) parts which are:

Section A: General information (general information);

Section B: Value Management and Sustainability (respondent’s knowledge in VM concept and approach, sustainability issues and design, their knowledge in sustainable policies and project development planning guidelines);

Section C: Project Sustainability (3 main themes of sustainability which are environmental, social and economic).

Five-point rating scales were used to rate project sustainability in the VM lab ranged from 1 (very high) to 5 (very low) with added a not applicable (N/A) option.

The Value Management Section in Economic Planning Unit (EPU) has been very co-operative to provide information regarding the lab activities— when, where

and which project will be conducted during the selected period of time. The survey was conducted from January 2013 to March 2013, which considered the best and peak time for questionnaire distribution due to VM labs demands were usually high at early of the years. During this period, there were a lot of VM labs conducted but only 4 labs were fit to the researcher criteria, which are:

- a. New projects proposal for government building, and
- b. Projects value more than RM 50 million and above.

Therefore to learn about the existing practice of VM in government projects for sustainable consideration, the target group for the survey is the person who involves and participates in the lab. The questionnaire was designed to collect data from the targeted respondents based on their self-evaluation of projects sustainability and their knowledge in sustainable issues within VM practice. Respondents were selected from 4 VM labs. Out of 120 questionnaires distributed, 109 were returned, 94 were completed and usable for data analysis which gives 78% of response rate. The questionnaire was distributed to the respondents administered by the authors.

The Value Management (VM) lab was conducted by government department, the Economic Planning Unit, Prime Minister Office (EPU, PMO). The best-suited method for data collection is questionnaire survey where used to investigate the sustainable consideration in the existing practice of VM which focus on government building projects. The concept of integrating sustainability with VM is new in Malaysia, thus the field study was conducted to investigate the existing practice of VM in Malaysian Government projects in addressing sustainability issues. The study

was to explore with a sample of VM practitioners to investigate sustainability consideration in Government projects.

## **Findings and Discussion**

94 responses were analyzed using Statistics Package for Social Science (SPSS) software to ensure the aim of this paper is accomplished.

Table 2 presents the profile of the respondents for this study. Most of respondents (31.9%) have working experience from 6 to 10 years while the least respondents have more than 20 years experience (18.1%). Most of the respondents (72.3%) were degree holders, followed by Masters holders (12.8%) and Diploma's holders (10.6%). Among others, there were 2 respondents hold AR (2.1%), and 1 respondent (1.1%) holds HND qualification, HSC qualification, and STPM certificate respectively. Most of the respondents (54.3%) have engineering background which consists of electrical, civil, and mechanical engineering. However, 13.8% of respondents did not have technical education background such as economics (3.2%) and 1.1% (1 respondent) for Business Administration, Information and Communication Technology (ICT), Political Science and Psychology studies respectively. It shows that the engineers (36.2%) dominated the VM lab, followed by stakeholders (19.1%), architects (16%) and the least is contractors (3.2%).

The stakeholder for this study is represented by end user which is affected by the project directly, Central Agency which approved the project budget allocation, local authorities, implementing agencies or utility providers. The reliability of the data is assessed according to the experience of the respondents in the involvement with the VM

lab. Therefore, this study found that 2 respondents have participated more than 10 labs while 6 responses that they have participated between 6 to 10 labs. Majority of the respondents (50%), have involved less than 5 VM labs and quite a number (41.5%) of them have never participated before.

## **Participant's role and knowledge**

The VM participant's role and their knowledge in value management and sustainability is assessed in order to determine the level of VM and sustainability knowledge. A five level scale ranged from 1 (very high) to 5 (very low), was used in order to measure VM participant's role and their knowledge. The knowledge in Value Management (VM) and sustainability is measured based on the knowledge or understanding in concept of Value Management, Value Management approach project in government, sustainable building, policy or legislation related to sustainable aspects, and guideline for preparing project development plan.

Figure 1 illustrates the knowledge of the Value Management (VM) lab participants about the VM and sustainability. This study found that the role of the participants in VM labs consist of client, stakeholder and team member have moderate knowledge or understanding about the VM and sustainability. The participants of VM labs have moderate knowledge and understanding in value management (VM) concept, value management (VM) approach in government project, sustainability issues in the project development, sustainable building or green building design, policies related to the sustainable aspects, and government documents or guideline for preparing the project development plan.

### **Level of project sustainability among the participants in VM Lab**

The level of the project sustainability in VM lab is assessed based on three (3) sustainable themes which are environment, economic and social sustainability. The five-point rating scale ranged from 1 (very high) to 5 (very low) was used to determine the level of project sustainability in the VM lab. The findings of this study found that most of the participants have high consideration in the project sustainability includes the sustainable themes. To be specific, most of the participants have high consideration in the environmental sustainability. It shows that all the VM lab participants agreed that the environment sustainability in the project development. The environmental sustainability consists of site selection, land utilization, process and method, and in-use impact. The participants agreed that the environmental sustainability can minimize the harmful and irreversible effects on the environment from the development and usage facilities.

Furthermore, the participants have high consideration in the social sustainability in the project development. The social sustainability includes the consideration of the well being and interest of the society includes the community, workers and future users. Thus, the participants of the VM lab which are facilitator, client, stakeholder and VM participants are agreed that the social sustainability should be highly considered in the project development. Besides, there is high level of economic sustainability in the project based on the role of VM participants. Most of the participants have high consideration in the environmental sustainability in the project because the economic sustainability provides the best value for money and cost effective for the project. In short, the participants of the VM

lab which are facilitator, client, stakeholder and VM participants are agreed that the social sustainability should be highly considered in the project development.

### **Conclusion**

The application of VM during the project development may be utilized to improve building sustainability. The appropriate approach of sustainable development as a process is able to balance and integrate social, economic and environmental sustainable values. In order to find an appropriate sustainable solution, any decision that is made must therefore add value (reduce risk) across all three dimensions namely sustainable themes. VM offers a method for stakeholders to achieve a better-built environment and improve the adopted construction process. It can be used to ensure the incorporation of principles of sustainable construction into decisions that affect not just new construction projects but also the efficient use of whole resources. VM has an abundance of techniques that are used to achieve the best solution to satisfy the client's needs at the lowest cost possible. This study found that the participants have high consideration in the project sustainable themes namely environmental sustainability, economic sustainability and social sustainability. This finding in line with the Abidin and Pasquire (2005) and Connaughton and Green (1996). Abidin and Pasquire (2005) stated that the VM capability for eliminating unnecessary cost, it is possible that sustainability could be upheld without unnecessary cost increase. Thus, the sustainability can be economically viable. However, it is contrast with Bartlett and Howard (2000) perceived that the sustainability increases the project development costs. This may lead to a seemingly conflicting interest. In Malaysia perspective, the VM has been recognized as



a value enhancement technique (EPU,2009) and this approach should incorporate sustainability issues into the analysis as well, as they will affect to the quality of the project outcome. The Economic Planning Unit (EPU) as the principal government agency, which, responsible for the preparation of development plans for the country, has taken major steps to impose the new policy as one of its strategic planning tool. This is to ensure cost optimisation and value for money can be achieved while meeting required performance levels in all its projects. The tool will help the government to find new ways, alternatives

and proposing best solution from the conventional ways. VM offers a method for stakeholders to achieve a better built environment and improve the adopted construction process. It can be used to ensure the incorporation of principles of sustainable construction into decisions that affect not just new construction projects but also the efficient use of whole resources. As conclusion, by committing to sustainability during value management (VM), it could lead to the vision of generating good economic return whilst delivering accountability and excellence in social and environmental performance.

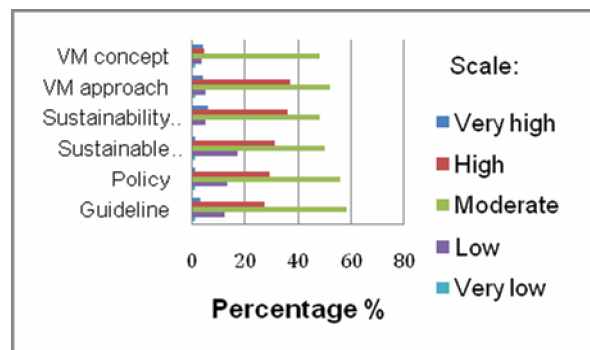
**Table.1** Barriers in Sustainable Construction

<b>Barriers</b>	<b>Description</b>
Lack of Awareness on sustainable building	Sustainability is still a relatively new concept for the construction industry in the developing countries of South-East Asia. Generally, there is an increase in awareness on sustainable building and construction in the region however it is not across the whole spectrum of the construction sector.
Lack of Training and Education in Sustainable Design and Construction	Many important stakeholders are not even aware of the concept of sustainable building and so are naturally resistant to change. Hence the greatest barrier is the lack of understanding of the need for sustainable design.
The higher cost of sustainable building Option	Many stakeholders are in the opinion that the construction industries won't go green unless it saves them money somehow. Majority of the clients have not been interested in any sustainable features except for energy efficiency aspects, which is believed to lead to an immediate paybacks.
Procurement issues	Undue emphasis on lowest price rather than best value impacts negatively on industry performance in terms of time, cost and quality. It affects the sustainability of enterprises and their ability to develop and retain a skilled workforce, and to actively promote safety, health and the environment.
Regulatory barriers	Public policies and regulatory frameworks do not encourage the development of the construction sector.

**Table.2** Respondents' Profile

Items	N=94	
	Frequency	Percentage (%)
<b>Work Experience (years)</b>		
Less than 5	20	21.3
6-10	30	31.9
11-20	27	28.7
More than 20	17	18.1
<b>Education Background</b>		
Architecture	16	17.0
Engineering	51	54.3
Quantity Surveyor	10	10.6
Planning	4	4.3
Others	13	13.8
<b>Participants Role</b>		
Client	10	10.6
Stakeholder	18	19.1
Architect	15	16.0
Engineer	34	36.2
Quantity Surveyor	7	7.4
Project Manager	7	7.4
Contractor	3	3.2
<b>Role</b>		
Facilitator	3	3.2
Client	19	20.2
Stake	13	13.8
Team	59	62.8
<b>Value Management (VM)</b>		
<b>Labs Participation</b>		
Never	39	41.5
< 5	47	50.0
6-10	6	6.4
> 10	2	2.1

**Figure.1** Value management participant's knowledge



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Implementing value management as